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**BROAD SPECTRUM LIGHT AND NIGHT-TIME  
MENTAL PERFORMANCE: EFFECTS OF INTENSITY  
AND DURATION**

A thesis completed in partial fulfilment of the requirements for the degree of  
Master of Arts.

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## ABSTRACT

The present study examined the effects of light intensity and duration on mental performance at night. A number of investigations have found light levels as low as 500 lux can have a significant impact on cognition, but there have been few, if any, systematic experiments that have investigated the potential trade-off between the intensity of the light and its duration. Light levels of 100 (normal room lighting), 300, 600 and 1,000 lux were paired with one of two different light exposure times: 15 and 60 minutes. Sixteen volunteers completed tests of critical thinking, simple maths, letter cancellation, recall, and recognition between 2300 and 0100 hours once a week for four consecutive weeks. Body temperature and subjective sleepiness levels were also recorded. The results showed that, in general, light intensities, irrespective of duration, of 300 and 600 lux had a positive effect on critical thinking and recognition memory. In contrast to some previous findings, there was little or no effect on sleepiness levels, core body temperature, recall, letter cancellation or the simple maths task. Surprisingly, the 1,000 lux light level had no effect on any of the tasks. It was concluded that changes in the intensity of broad-spectrum light can affect night-time cognitive performance, but that the intensity of the light cannot be traded for duration. However, further investigation of the manner in which light intensity is varied, either by distance from the light or by varying the brightness of the light source, is required before firm conclusions can be drawn.

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# TABLE OF CONTENTS

	Page
<b>ABSTRACT</b>	ii
<b>ACKNOWLEDGEMENTS</b>	iii
<b>TABLE OF CONTENTS</b>	iv
<b>LIST OF TABLES</b>	vii
<b>LIST OF FIGURES</b>	ix
<b>INTRODUCTION</b>	
Background	1
Underlying Theories	4
The Physiological Location of Circadian Timekeeping	4
Characteristics of Circadian Rhythms	7
The Pineal Gland and Melatonin	8
Body Temperature, Melatonin, and the Sleep/Wake Cycle	10
The Impact of Light on Circadian Rhythms	11
In Search of the Light Intensity Threshold	17
Influences on Work Performance at Night	21
The Present Study	23
<b>METHOD</b>	
Participants	26
Design	27
Apparatus	29
Measures	
Subjective Sleepiness	33

Temperature	34
Performance Measures	34
Word Recall Task	35
Critical Thinking Task	36
Mathematics Sums	38
Letter Cancellation Task	38
Recognition Task	39
Demographic Information	40
Procedure	40
Statistical Analysis	41
<b>RESULTS</b>	
Speed-Accuracy Trade-off	42
Performance Tasks	43
Recall Task	43
Critical Thinking Task	45
Mathematics Sums	47
Letter Cancellation Task	50
Recognition Task	52
Sleepiness	54
Temperature	55
Demographic Information	57
<b>DISCUSSION AND CONCLUSIONS</b>	58
Limitations of the Present Study	68
Further Research	69
Conclusions	70

## REFERENCES 72

## APPENDICES

Appendix A	Order of Exposure to Experimental Conditions Across the 4-Week Period	76
Appendix B	Sleepiness & Demographic Questionnaire & Temperature & Test Scoring Form	77
Appendix C	Does Working at Night Affect Performance? Information for Participants	80
Appendix D	Does Working at Night Affect Performance? Consent Form	84
Appendix E	Standardised Instructions	85
Appendix F	Example of Performance Tasks	90
Appendix G	MANOVA Results	95
Appendix H	Means and Standard Deviations for Sleepiness, Temperature, and Performance Tasks, at each level of Intensity and Duration	103



## LIST OF TABLES

Table 1	Correlations Between Speed and Accuracy for Maths, Letter Cancellation (LC), and Critical Thinking (CT) Tasks, Collapsed Across all Four Sessions and Both Durations	42
Table 2	Recall Task Mean (M) Percentage Scores and Standard Deviations (SDs) for all Intensity and Duration Conditions	44
Table 3	Critical Thinking Task Mean (M) and Standard Deviation (SD) Percentage Scores for all Light Intensity and Duration Conditions	45
Table 4	Critical Thinking Task Mean (M) and Standard Deviation (SD) Completion Times for all Light Intensity and Duration Conditions	47
Table 5	Mathematics Sums Task Mean (M) and Standard Deviation (SD) Percentage Scores for all Light Intensity and Duration Conditions	48
Table 6	Mathematics Completion Time Mean (M) and Standard Deviation (SD) Results for all Light Intensity and Duration Conditions	49
Table 7	Letter Cancellation Task Mean (M) and Standard Deviation (SD) Percentage Scores for all Light Intensity and Duration Conditions	51
Table 8	Letter Cancellation Task Mean (M) and Standard Deviation (SD) Completion Times for all Light Intensity and Duration Conditions	52



Table 9	Recognition Task Mean (M) and Standard Deviation (SD) Percentage Scores for all Light Intensity and Duration Conditions	53
Table 10	Sleepiness Mean (M) and Standard Deviation (SD) Scores for Each Intensity Level and Duration at the Three Times of Testing, Collapsed Across the Four Nights	55
Table 11	Temperature Mean (M) and Standard Deviation (SD) Scores for Each Intensity Level and Duration at the Three Times of Testing, Collapsed Across the Four Nights	56

## LIST OF FIGURES

Figure 1	Midsagittal section of the human brain showing the pineal gland, suprachiasmatic nucleus, and hypothalamus	5
Figure 2	ThermoScan thermometer	31
Figure 3	How the ThermoScan thermometer measures the core body temperature through the ear	32